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Changing Canyon Trail



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Since their uplift 15 million years ago, thousands of feet of stone have eroded from the mountains leaving a core of ancient metamorphic rock and their granite intrusions. These form the canyon walls that are seen today.

Introduction

Some changes go unnoticed while others occur with lightning speed. To help understand past and present occurrences here in Lamoille Canyon, special stations have been identified along the trail. Corresponding questions and answers are provided in this brochure. A map is included. The trail is $\frac{1}{2}$ mile long and takes 30 to 40 minutes to walk.



What created this opening in the thicket? Look to the canyon wall in front of you for a clue. Can you see the path or chute through the rocks and bushes?

AVALANCHE! In winter, snow on the steep canyon wall plunges to the bottom, stripping vegetation and rocks from its path. The avalanches generally stop before running this far. Every 10 to 20 years, however, heavy snows spawn an avalanche large enough to sweep across the highway, scarring or toppling trees and bushes.



Listen! The air is saturated with sounds.
What can you hear?

CANYON VOICES. Wind, trees, water, squirrels, and birds are but a few of the sounds combining in an ever-changing canyon chorus.

Many birds are attracted to the canyon.

Ground nesters: Juncos and night hawks.

Shrub nesters: Scrub jays, robins, or hummingbirds.

Tree nesters: Warblers, mourning doves, hawks,
and owls.

Cavity or hole nesters: American kestrels, bluebirds,
woodpeckers, flickers, and swallows.

Cliff nesters: Wrens, ravens, and swallows.



Why are some of the aspens dying? What changes occur among animals in the forest community as a result?

DISEASES. Aspens have a short life span—for trees. As they approach the century mark, they attract cankers and rots that gradually close the tubes and pores carrying food and water throughout the tree. The thin bark—a living part of the tree—is easily broken, allowing diseases ready access. Note the many “wound” marks on the aspens.

For cavity-nesting birds such as woodpeckers and flickers, the softened wood is an ideal place to carve a nesting hole. Their holes may be used in turn by others, such as bluebirds, kestrels, and even squirrels.

Carving initials in aspen trees, or chopping with axes, opens wounds where bacteria and fungi may enter, eventually killing the trees.

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CATALOGING PREP



What force smoothed and rounded this rock outcrop?

GLACIERS. Massive sheets of ice and rock ground their way across this hunk of granite some 20,000 years ago. The glaciers—at times 700 feet (200 meters) thick—advanced and receded with long-term temperature changes. Pressures at the bottom of the glaciers approached 40,000 pounds on each square foot of this rock—twice the pressure in a steam locomotive piston.

As gravity dragged the glacier down the canyon—at speeds of one to three feet per day—the shearing force of the ice and rock, combined with glacial weight, ground the rough edges from this outcrop.



Who was the “Paul Bunyan” that toppled this grove of aspen? What differences can be seen in plants growing here and in nearby woods?

BEAVER. The aspen trees once growing here were cut by beavers for food and construction material. Evidence suggests that two colonies—up to 20 beavers—may have made their homes along this section of Lamoille Creek. That’s a large beaver community!

As the beavers removed the trees, the soil was exposed to sunlight, warmed, and dried. More grasses began to grow. Grass provides food for livestock that graze the canyon bottom in summer. Deer also forage in openings not far from protective cover of the woods.



Why do the plants here differ from those on the canyon walls?

SUN, SOIL, AND WATER. Plants reflect their growing conditions. Temperature, soil nutrients, moisture, and elevation all influence the location of plant communities.

The best soil is found at the canyon bottom. Nutrients washed from the sides of the canyon combine with leaves and other decaying vegetation to form a rich soil that produces lush meadows and large aspen groves.

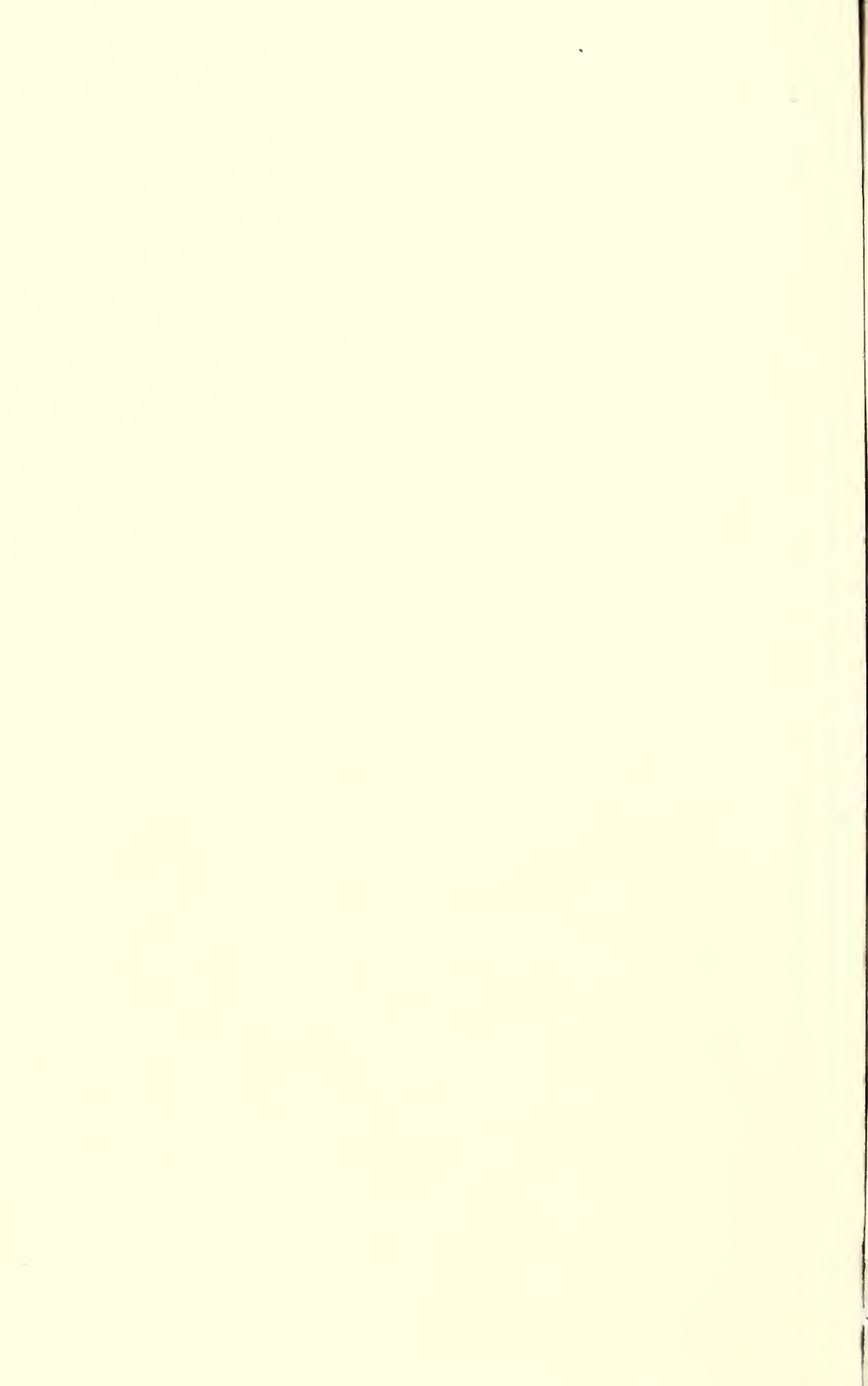
The north-facing canyon wall, while lacking rich bottom soil, is cool and shaded—and more moist than across the canyon. Scrubby aspens and other shrubs, as well as scattered limber pines, dot the slopes.

Under sunlight year-round, the south-facing canyon wall is hotter and dryer. Mountain mahogany is accustomed to these conditions. Limber pines are confined mostly to the highest elevations.



How is life changing in and around this spring?

WOODS TO MEADOWS TO— Once this spring trickled through cool, shaded woods to Lamoille Creek. Beavers cut the aspen letting in warming sun. They also dammed the spring, slowing its flow. Now the dams are broken and the spring is free-flowing again. Plants and animals living in the water have adjusted and changed with these shifts in their environment.



Changing Canyon Trail

GLACIAL SCoured CANYON WALLS

PARKING AREA

HANGING VALLEY
OVERLOOK

ROCK

ORIENTATION SIGN

GLACIAL ROCK

SPRING

ABANDONED BEAVER DAM
AND LODGE

GLACIAL ROCKS

LAMOILLE CREEK



TRAIL LEGEND

- STATIONS
- ▼ BROCHURE BOXES
- ⌘ REST BENCHES



What has happened to the beavers in this part of Lamoille Canyon?

ABANDONED HOMES. Most of the beaver dams are broken or filled with mud and debris. Houses have collapsed. The beavers, and their careful maintenance, are gone!

There are reasons for this change. Most of the food and building material near the dams had been cut and used. The beavers had to travel farther and take longer to replenish their supplies, making them easy prey for predators. Finally, the beavers migrated to a more favorable place.

What can we learn from the beavers? With study and experience, people can plan for, and use forest resources wisely—maintaining a continuing supply for their children and for generations beyond. Then, people don't have to abandon their homes and move on as the beavers do.



What sparked the growth of young trees in this area?

GIANT BEAVER? Sometimes when healthy young trees are cut by beavers, their stumps and roots send up new shoots or sprouts. The sprouts are an excellent source of food for deer, livestock, and beavers themselves.

Some of the sprouts may grow into a new woodland, replacing the trees cut earlier.

Notice several very high stumps in the area. Were these cut by "giant" beavers? Not really! The beavers had a platform—a layer of frozen snow—on which to stand to cut trees in winter when food stored in their ponds ran low.



What changes occur in the flow of this stream during the year?

UP AND DOWN. Lamoille Creek fluctuates with the seasons. Note the scoured, rocky streambed and bits of flood debris lodged among the rocks.

Spring rains and melting snow swell the flow to 1,800 gallons per minute—sometimes more! Boulders exceeding 100 pounds are rolled along at flood stage. In the fall, the flow dwindles to a mere 40 gallons per second—gently floating golden aspen leaves toward the valley.

Examination of stream flow patterns helps forest managers understand how to care for the land to reduce serious flooding.



Look closely at the large rocks on either side of the trail. Can you see the tiny, flat lichens (green and grey) and fuzzy balls of moss growing on the rocks? (Please leave them for others to discover.)

SOIL FROM ROCK. Lichens are primitive plants composed of algae and fungi living together. As they grow, they weaken the surface of the rock forming bits of soil-like material. Moss then takes over, creating slightly better “soil.”

Other plants take root in this new soil, the pressure of their roots splitting the rock further. Water enters the cracks and expands when it freezes, exerting even more pressure.

Although the process is extremely slow, action by plants and water eventually turns rock into soil—a very precious source of life.

To conserve soil, the use and management of forest resources must be carefully planned.



Sit down and relax. Reflect on what you have learned, observed, or become reacquainted with.

TIME AND CHANGE. Here in Lamoille Canyon are evidences of changes past and the beginnings of new tomorrows. Over millions of years, mountains were formed and partially eroded away. Floods of water and glacial ice scoured out canyons. Even now, water continues to wear away peaks and valleys. Plants add their growing power to the destruction of rock while giving birth to new soil.

Plants and animals within the canyon are changed by the physical forces of erosion; by their exposure to sun, soil, and moisture; and by biological factors such as disease, predators, and their own use of the environment.

Trees, beaver ponds, insects—all living things and their homes—are not the same today as they were yesterday or will be tomorrow. All are changed by the environment; all make changes in the environment.

People use the canyon and its resources too—for livestock pasture, game hunting, water for farms and communities, year-round recreation, and simple relaxation. All cause changes.

Contemplate—pause—and enjoy. Think about these and other changes in Lamoille Canyon that are important to you. Come back again and bring a friend.



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IN THE BOX NEAR THE END OF THE TRAIL FOR OTHERS TO
USE.

If you would like further information, or to offer suggestions for making the "Changing Canyon Trail" more interesting, cut off this self-addressed card and send it to the Forest Service.

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